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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,726	08/29/2003	Mike Suk	HSJ920030101US1 (HITG.038)	9715
7590	12/14/2004		EXAMINER NEGRON, DANIEL L	
Crawford Maunu PLLC Suite 390 1270 Northland Drive St. Paul, MN 55120			ART UNIT 2651	PAPER NUMBER

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,726

Applicant(s)

SUK, MIKE

Examiner

Daniell L. Negrón

Art Unit

2651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-12, 14-20 and 22-27 is/are rejected.
- 7) ☒ Claim(s) 5, 13 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08/29/03
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on August 29, 2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 6-9, 14-17, and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forehand U.S. Patent No. 6,760,174 in view of Kamijima U.S. Patent Application Publication No. 2003/0099054.

Regarding claims 17 and 22-24, Forehand discloses a storage device (100) comprising a magnetic recording medium (108) for recording data thereon, a transducer (118) having a MR element for reading data stored in the magnetic recording medium, a motor (104), coupled to the magnetic recording medium, for translating the magnetic recording medium, an actuator (114) coupled to the transducer (118), for translating the transducer relative to the magnetic recording medium (see Fig. 1 and disclosure thereof for details).

Forehand further discloses a storage device signal processor (142), coupled to the motor (104), transducer (118), and actuator (114) for writing with the transducer reference data at a radius on the magnetic recording medium (108), attempting to read the written reference data,

Art Unit: 2651

and determining whether the read attempt was successful (column 4, lines 13-18 and column 5, lines 2-8).

Forehand further discloses increasing the protrusion (i.e. decreasing the fly height) of the transducer (118) until a read attempt is successful in order to detect read signals with low amplitude (column 3, lines 15-25), but fails to show the specifics of increasing the protrusion through the use of a heating element and adjusting the level of heating on the heating element to increase protrusion and attempting to write or read data at different drive temperatures.

Kamijima however discloses a storage device with a transducer comprising an integrated heater, which causes the transducer element to thermally expand and protrude an air bearing surface during both write and read processes above a magnetic recording medium for the purpose of compensating for a decreased quality of a read signal (page 1, paragraphs 7 and 11, page 5, column 2, lines 3-12). Furthermore Kamijima discloses that controlling the fly height of the transducer is precisely adjusted by controlling the heating value of the heater (page 1, paragraph 11, lines 7-9).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the storage device disclosed by Forehand with the transducer heating teachings of Kamijima in order to precisely control the fly height of the transducer during write and read processes and improving the signal reading/writing capability of the transducer due to increased data density.

Regarding claim 25, method claim 25 is drawn to the method of using the corresponding apparatus claimed in claim 17. Therefore method claim 25 corresponds to apparatus claim 17 and is rejected for the same reasons of obviousness as used above.

Regarding claims 26 and 27, claims 26 and 27 have limitations similar to those treated in the above rejection of claim 17, and are met by the references as discussed above.

Regarding claims 1 and 6-8, method claims 1 and 6-8 are drawn to the method of using the corresponding apparatus claimed in claims 17 and 22-24. Therefore method claims 1 and 6-8 correspond to apparatus claims 17 and 22-24 and are rejected for the same reasons of obviousness as used above.

Regarding claims 9 and 14-16, claims 9 and 14-16 have limitations similar to those treated in the above rejections of claim 17 and 22-24, and are met by the references as discussed above.

4. Claims 2-4, 8, 10-12, 16, and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forehand U.S. Patent No. 6,760,174 as modified by Kamijima U.S. Patent Application Publication No. 2003/0099054 and further in view of Tokuyama et al U.S. Patent No. 6,594,104.

Regarding claims 18 and 19, Forehand as modified by Kamijima discloses a storage device with all the limitations of claim 17 as discussed above, but fails to show recording of the level of heating on a disk required to read the reference data successfully.

Tokuyama et al however, discloses a magnetic disk device comprising a heating controller wherein a table (e.g. look-up) is implemented to store values which correspond to heating levels (i.e. desired temperatures) of the head during a read/write process at specified locations on the disk for the purpose of compensating for problems caused by thermal expansion (i.e. deformation) during writing (column 1, lines 51-55, column 2, lines 15-23, and column 2, lines 34-38).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the storage device disclosed by Forehand as modified by Kamijima with the magnetic disk device with a table for recording heating levels in order to enable access of values which compensate for read/write errors or positioning variation that are caused by thermal expansion of the head, thus improving the quality of the read/write signals.

Regarding claim 20, claim 20 have limitations similar to those treated in the above rejection of claim 22, and are met by the references as discussed above.

Regarding claims 2-4 and 8, method claims 2-4 and 8 are drawn to the method of using the corresponding apparatus claimed in claims 18-20 and 24. Therefore method claims 2-4 and 8 correspond to apparatus claims 18-20 and 24 and are rejected for the same reasons of obviousness as used above.

Regarding claims 10-12 and 16, claims 10-12 and 16 have limitations similar to those treated in the above rejections of claim 18-20 and 24, and are met by the references as discussed above.

Allowable Subject Matter

5. Claims 5, 13, and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 5, 13, and 21, prior art fails to show a method or apparatus for providing protrusion feedback for a read/write element in a storage device wherein a recording of the level of heating required to read the reference data successfully further comprises providing

Art Unit: 2651

the heating levels for the different temperatures in a look-up table for providing a correct heating level at any temperature.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniell L. Negrón whose telephone number is 703-305-6985. The examiner can normally be reached on Monday-Friday (8:30-6:00) Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh N. Tran can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN 
December 8, 2004


SINH TRAN
PRIMARY EXAMINER